

REMARKS

Entry of the foregoing, further examination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1-15 and 17-20 were pending. By the present response, claims 1 and 6 have been amended, claim 4 has been canceled, and claim 21 has been added. Upon entry of the present response, claims 1-3, 5-15 and 17-20 are pending and await further consideration on the merits. Support for the amendments and new claim can be found at least at page 1, lines 21-26; page 2, lines 16-22; page 5, lines 5-12, of the specification; Figures 1-2 and the original claims.

Entry of the foregoing is appropriate pursuant to 37 C.F.R. §1.116 because the amendments to claims 1 and 6 are clarifying in nature and do not constitute new limitations or changes requiring additional search and/or substantive re-examination.

Applicants wish to thank Examiners Belyaev and Daniels for the courtesies extended to Applicants' representative during a personal interview conducted on March 31, 2011 in the U.S. Patent and Trademark Office. During the interview, it was agreed that the substance of claim 6 is patentably distinguishable over the current grounds for rejection. It was also agreed that the amendment to claim 6 (replacing "partially" with --reduced--) would be sufficient to overcome the current grounds for rejection under 35 U.S.C. §112, second paragraph. Thus, while no final agreement was reached concerning allowability of the claims of the present application, the prosecution was clearly advanced and is believed will ultimately result in allowance of the application. Specific details and issues which were

encompassed by the discussions had during the above-mentioned personal interview are incorporated in the following remarks.

CLAIM REJECTIONS UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Claim 6 stands rejected under 25 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While not acquiescing in the rejection, Claim 6 have been amended in a manner which was suggested in the personal interview of March 31, 2011, and which was agreed would be adequate to overcome the aforementioned grounds for rejection.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 1-11 and 18-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,481,023 to Quenzer (hereafter "*Quenzer*") and in view of the publication Compact Self-Aligning Assemblies with Refractive Microlens Arrays made by Contactless Embossing by Schulze (hereafter "*Schulze*"), and further in view of U.S. Patent No. 6,951,119 to Marechal (hereafter "*Marechal*") on the grounds set forth in paragraph 3 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

The present invention is directed to a method of treating a surface of a pre-existing optical lens in order to improve the optical properties of the previously-formed lens. A method performed according to the principles of the present invention is set forth in amended claim 1.

Amended claim 1 recites:

1. *A method for follow-up treatment of the contour of the surface of at least one as-formed convex optical lens, the method comprising:*

providing the as-formed convex optical lens which is made of glass or a glass-type material and which has a convex lens surface delimited by a circumferential line abutting on a plane section surrounding said circumferential line and which has an opposing surface of the lens facing the convex lens surface, and an elliptical gradient in the region of the circumferential line,

placing along said circumferential line of the as-formed convex optical lens on said plane section a means matching said circumferential line and at least laterally bordering said convex lens surface,

performing a temperature treatment comprising heating said as-formed convex optical lens to a temperature of at least the transformation temperature of said glass or glass-type material, wherein pressure equalization prevails between said convex lens surface and said opposing surface of the lens, and

removing said means from said optical lens after a period of time, during which said optical lens undergoes said temperature treatment and subsequent cooling below said transformation temperature

wherein the steps are performed in the recited sequence and result in the modification of the elliptical gradient.

As evident from the above, claim 1 requires, *inter alia*, a method wherein an elliptical gradient in the region of a circumferential line of an as-formed convex optical lenses is subsequentially modified. Even if the proposed three-reference combination of prior art were appropriate, which it is not, no combination of the above-identified three prior art references results in the method recited in amended claim 1.

The PCT equivalent of *Quenzer* (WO 01/38240) is identified and discussed on page 1 of the present specification. *Quenzer* discloses a conventional "glass flow" process for producing an array of microlenses. As noted in the present specification, an innate characteristic of such microlens formation techniques is a steep elliptical gradient at the edge region of each single lens, as identified by line 1 in Figure 2 of

the present application. It is alleged on page 3 of the Official Action that "Quenzer discloses a method for treatment of the contour of the surface of at least one optical lens" This characterization of the disclosure of *Quenzer* is respectfully traversed. In fact, *Quenzer* is directed to the formation of a lens or plurality of lens formations from a glass substrate material. *Quenzer* does not disclose a method for "treatment of the contour of the surface of at least one as-formed optical lens." Instead, *Quenzer* is directed to the initial formation of a lens structure, and not the treatment of an existing or as-formed lens. *Quenzer* discloses that the lens formations can be attained through a process which includes the inflow of glass into silicon surface structures (see, e.g., column 7, lines 25-26). To reiterate, as acknowledged in the present specification, the resulting lens formations produced by the method described by *Quenzer* results in formation of steep elliptical gradients along the border defined by the circumferential edge of the lens formations themselves. Thus, it is an object of the present invention to improve the optical properties of a lens structure formed according to the technique of *Quenzer*.

Quenzer fails to disclose, or even suggest, a method which involves the modification of an elliptical gradient in the region of a circumferential line present in an as-formed convex optical lens as required by amended claim 1.

Schulze is directed to a technique for producing microlens arrays by contactless embossing. This technique is schematically represented, for example, in Figure 2 on page 25 of *Schulze*. As illustrated therein, a molding tool is applied to a flat substrate lens material in order to form a microlens array or plurality of convex optical lens formations onto the substrate. According to *Schulze*, "proper control of pressure and temperature ensures that the material penetrating into the opening of

the tool forms a spherical surface." Thus, like the disclosure of *Quenzer*, *Schulze* is directed to a technique for forming a convex optical lens in the first instance, but is not directed to a method or technique for the modification of the shape of such a convex optical lens of an already or "as-formed" convex optical lens. Therefore, it is respectfully submitted that even if *Quenzer* or *Schulze* were combined, this aspect of the method recited in amended claim 1 would not be satisfied.

Moreover, the grounds for rejection are based on the premise that it would have been obvious to one of ordinary skill in the art to have modified the method disclosed by *Quenzer* in light of the disclosure of *Schulze*. This assertion is respectfully traversed. In particular, as previously noted, amended claim 1 is directed to a method which results in the modification of the elliptical gradient in the region of a circumferential line of an as-formed convex lens. However, at least according to the disclosure of *Schulze*, the contactless embossing technique described therein is already capable of producing lens formations which have "a spherical surface." Therefore, assuming *arguendo* that one of ordinary skill was aware that the technique for forming convex lens structures of *Quenzer* results in a steep elliptical gradient along the region of a circumferential line of the lenses, one of ordinary skill in the art would not have thought to modify the technique of *Quenzer*. This is because one of ordinary skill in the art would simply follow the technique disclosed by *Schulze* (contactless embossing) in favor of the technique described by *Quenzer*. In other words, assuming for the sake of argument that the claims made in *Schulze* are true, and that a purely spherical convex lens surface can be formed by the contactless embossing technique described therein, there would simply be no need to turn to any other technique or teaching in the prior art in order to accomplish

this objective. Conversely, there would seemingly be no need or reason to modify the technique disclosed by *Schulze*. Thus, it is respectfully submitted that one of ordinary skill in the art would not have thought to modify the method disclosed by *Quenzer* in view of the method disclosed by *Schulze*.

It is further alleged on page 4 of the Official Action that at least *Quenzer*, and perhaps *Schulze*, is interpreted as satisfying "the second step" of the "two-step process." More specifically, it is alleged that the Examiner interprets that the start of the second step is the precise moment when the invention disclosed by *Quenzer* forms a convex lens surface. These assertions are respectfully traversed. As evident from the above, amended claim 1 is directed to a method which includes, in sequence, providing an as-formed convex optical lens having an elliptical gradient in the region of the circumferential line. Claim 1 then further species that, with respect to the as-defined previously formed convex optical lens having a preexisting elliptical gradient in the region of the circumferential line, "placing along said circumferential line of the as-formed convex optical lens on said plane section, a means matching said circumferential line, and at least laterally bordering said convex lens surface." Therefore, according to the requirements of amended claim 1, the "means" is applied to a surface of the lens which already includes a previously defined or as-formed elliptical gradient in the region of the circumferential line. These requirements of amended claim 1 precludes the above-noted interpretation proposed on page 4 of the Official Action. Moreover, amended claim 1 specifies that the means is placed along such circumferential line of an "as-formed convex optical lens." It is respectfully submitted that the convex lens is not formed until the procedure for its manufacture is complete. In other words, an intermediate product or incomplete

product or formation at some point prior to completion does not constitute an "as-formed convex optical lens."

It is alleged on pages 4-5 of the Official Action that *Marechal* discloses a two-step process for molding glass articles. In light of this alleged disclosure of *Marechal*, it is further asserted that it would have been obvious to one of ordinary skill in the art in view thereof to perform the method disclosed by *Quenzer* in view of *Schulze* in two steps. "Since it is known to press glass articles, including lenses." First, the grounds of rejection are deficient in that they fail to specify the proposed modification of the method allegedly taught by *Quenzer* in view of *Schulze*. More specifically, the "two steps" which are alleged to be obvious in the grounds of rejection are not specified and the context of the method resulting from the combination of *Quenzer*, *Schulze* and *Marechal*. Should the grounds of rejection be maintained, clarification of the grounds for rejection is respectfully requested.

In addition, one of ordinary skill in the art never would have applied or turned to the teachings of *Marechal* in an attempt to modify the method resulting from the alleged combination of *Quenzer* and *Schulze*. This is because the two methods (the method of *Quenzer* and *Schulze* on the one end and the method of *Marechal* on the other) are completely and inopposite and incompatible with one another. *Schulze* makes it abundantly clear that a prerequisite of the contactless embossing technique described therein, which is essential to the grounds for rejection, must be a technique that is formed without contact, as the name implies. For instance, *Schulze* discloses on page 24 that in a standard embossing scheme, plastic is introduced into a cavity and pressed "to ensure that the plastic fills the cavity of the tool perfectly." In contrast to such techniques, including the pressing technique of *Marechal*, the

contactless embossing technique of *Schulze* is based on an entirely different premise:

The basic idea of the CEM embossing scheme is different. There is no direct contact between the surface of the microlenses and the molding tool during lens formation.

As further described by Schulze, "another benefit of this new fabrication method is the fact that the quality of the lens surface is not effected by the surface quality of the molding tool."

In contrast to the above, *Marechal* is clearly directed to an older technology which relies upon pressing of the lens material against the surfaces of a mold in order to form the shape thereof. It is exactly this type of technique which is criticized, and actually forbidden, according to the teachings of *Schulze*. Thus, it is respectfully submitted that one of ordinary skill in the art would never have applied the teachings of *Marechal* to the combined teachings of *Quenzer* and *Schulze* as alleged in the grounds for rejection. For this reason alone, the rejection is improper and must be withdrawn.

Thus, for at least the reasons stated above, reconsideration and withdrawal of the grounds for rejection is respectfully requested with respect to amended claim 1. The remaining claims rejected on the above-noted grounds depend from claim 1. Thus, these claims are also distinguishable over the applied prior art for at least the same reasons noted above.

In addition, as agreed during the personal interview conducted on March 31, 2011, claim 6 is allowable over the applied prior art of record. In particular, amended claim 6 further specifies that the elliptical gradient is reduced or completely eliminated by the specific procedure or method recited in amended claim 1. Both

the techniques described by *Quenzer* and *Schulze* involve beginning with an initially horizontal surface of a substrate, and subsequentially increasing the curvature, or rate of curvature thereof. The opposite is required by claim 6. Namely, claim 6 requires a reduction or decrease in the curvature, or rate of curvature of a previously as-formed convex lens surface. Thus, with respect to the Examiner's previous interpretation that an optical lens is somehow formed as an intermediate step or point within the process of either *Quenzer* or *Schulze*, and the application of the tool thereto satisfies the requirements of the claimed invention, claim 6 makes it even clearer that this cannot be the case. Thus, indication of the allowability of claim 6 is respectfully requested.

NEW CLAIM 21

Newly presented claim 21 is an independent claim which essentially corresponds in scope to previously presented dependent claim 6. Thus, newly presented claim 21 is also distinguishable over the applied prior art for at least the same reasons previously noted above in connection with dependent claim 6. Thus, an indication of allowability of claim 21 is respectfully requested.

CONCLUSION

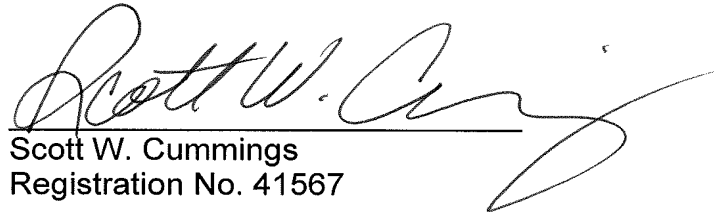
From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: April 8, 2011

By:

A handwritten signature in cursive script, appearing to read "Scott W. Cummings", written over a horizontal line.

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